

MFOQA

Military Flight Operations Quality Assurance



Fleet Operational Readiness Improvement

Proactive Hazard Identification and Elimination



MFOQA

Military Flight Operations Quality Assurance

**A knowledge management process that
uses downloaded flight data after *every*
flight
to provide
aircrew, the squadron and the Fleet with
quantitative information
regarding *aircrew* and *aircraft*
performance
to improve
*training, operational readiness and safety.***



FLIGHT DATA USAGE

TRADITIONAL

- ✈️ Post-mishap
- ✈️ Short duration
- ✈️ Lengthy processing
- ✈️ Specialized training

REACTIVE

MFOQA

- ✈️ Every flight
- ✈️ Entire flight
- ✈️ Available for debrief
- ✈️ User Friendly

PROACTIVE

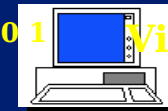


MFOQA



Data Recorder

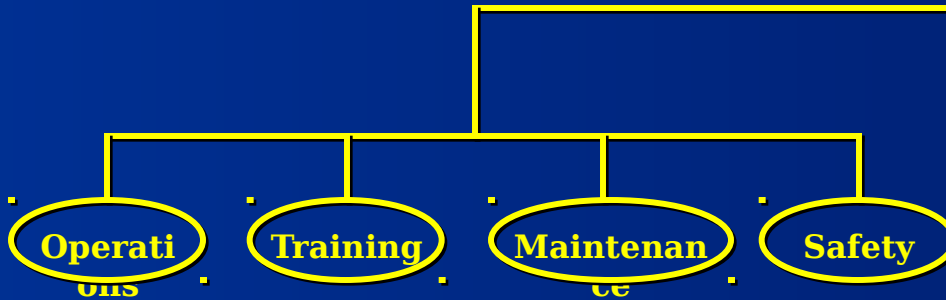
1 0 0 1 1 1 0 1 0 0 0 1



Visual Learning
Animated
Debrief
&
Automated
Analysis

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Squadron



Trend Analysis
and Data
sharing



AIRCREW BRIEF

FLY MISSION

DATA DOWNLOAD

**SELF -
CORRECTIVE
ACTION**

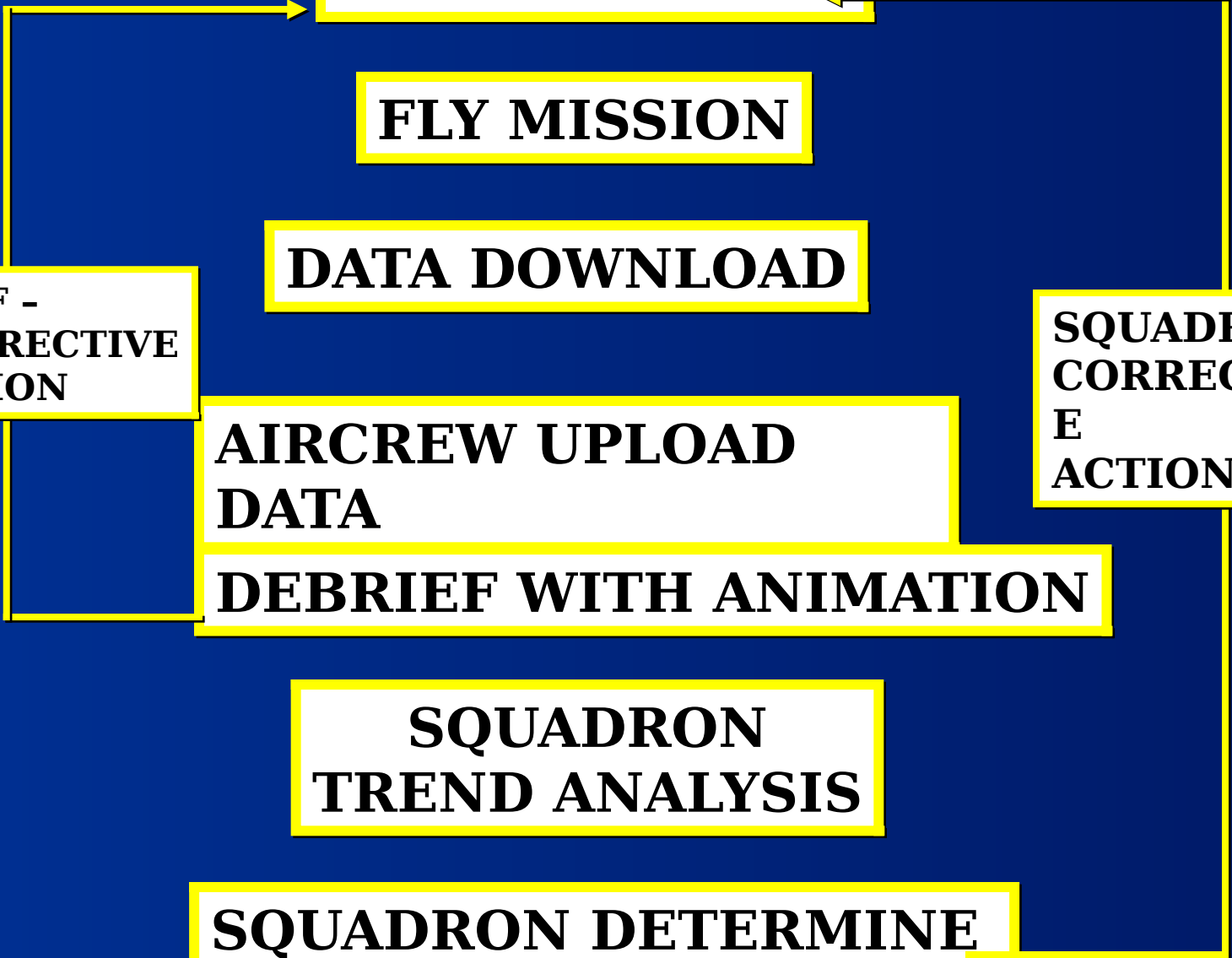
**AIRCREW UPLOAD
DATA**

**SQUADRON
CORRECTIV
E
ACTION**

DEBRIEF WITH ANIMATION

**SQUADRON
TREND ANALYSIS**

**SQUADRON DETERMINE
CORRECTIVE ACTION**





Commercial FOQA Successes

- First year savings, historically pays for program**
- Unstabilized approaches went from a high occurrence to virtually zero by “self-correction”**
- Savings in over & under-reported flap exceedances**
- Procedure change for auto-throttle saved \$122M in engine changes in 12 months**
- Charlottesville ILS changed due to GPWS warnings**
- FAA has approved non-punitive data collection and analysis systems**



Military Applications and Early Successes



USAF C-17 Program

- ✈ **Early C-17 program plagued by excessive G landings causing cracks in Main Landing Gear**
- ✈ **Young O-3 pilot identified the problem using Maintenance MFOQA data**
 - **MFOQA Data Allowed:**
 - (1) Identification of a training deficiency**
 - (2) Establishment of corrective procedures**
 - (3) Validation of the “fix”**



Why a Naval Aviation MFOQA Program?



VADM Malone (CNAF)

Said it Best

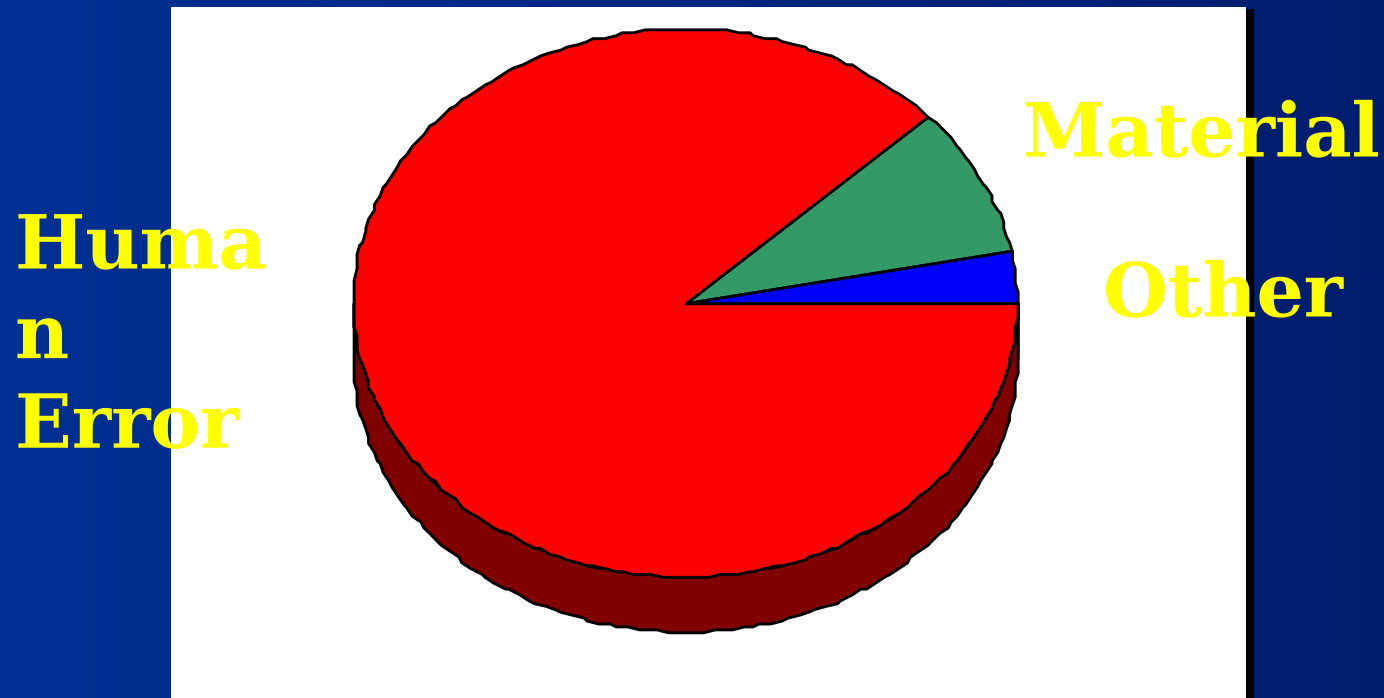
“ We are expecting more than ever from even our most junior aviators. We have allowed our quest for tactical proficiency to overshadow the importance of aviation fundamentals and the basic tenants of our profession”

7 Jan 2003 CNAF P4

“ORM and Fundamentals Review”



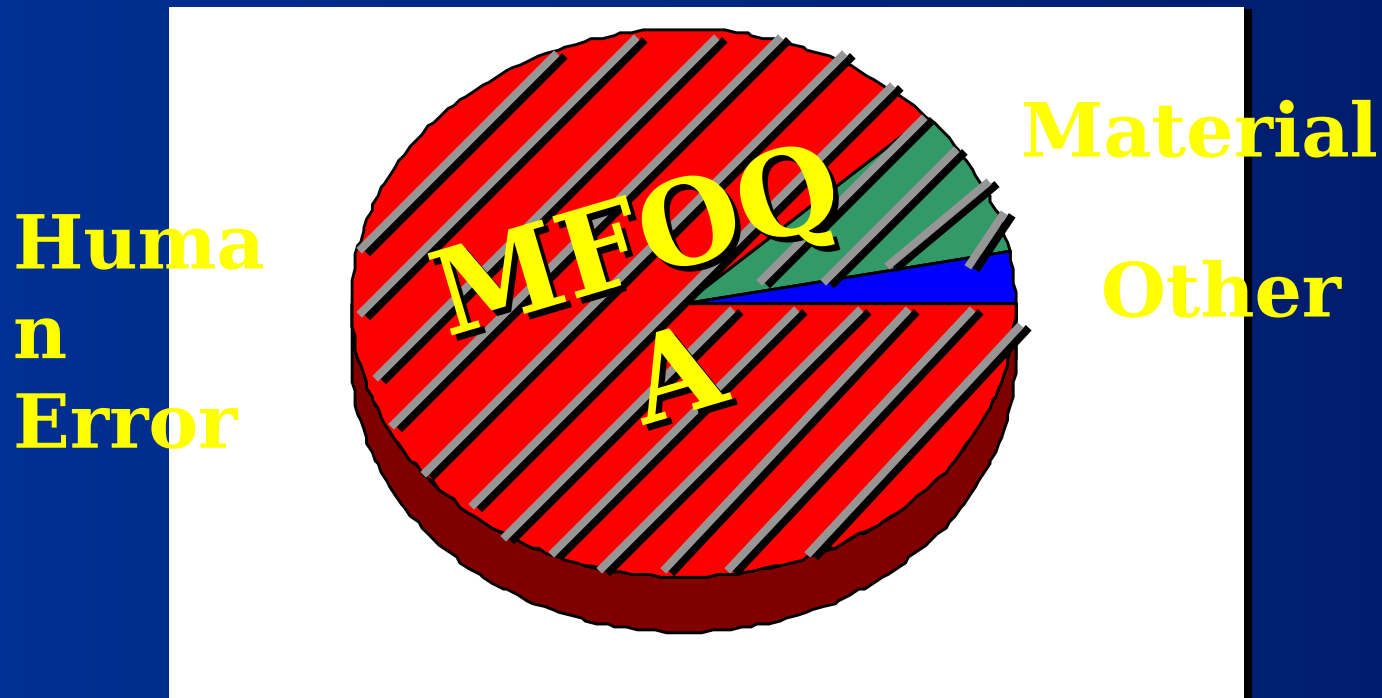
Proactive Use of Data



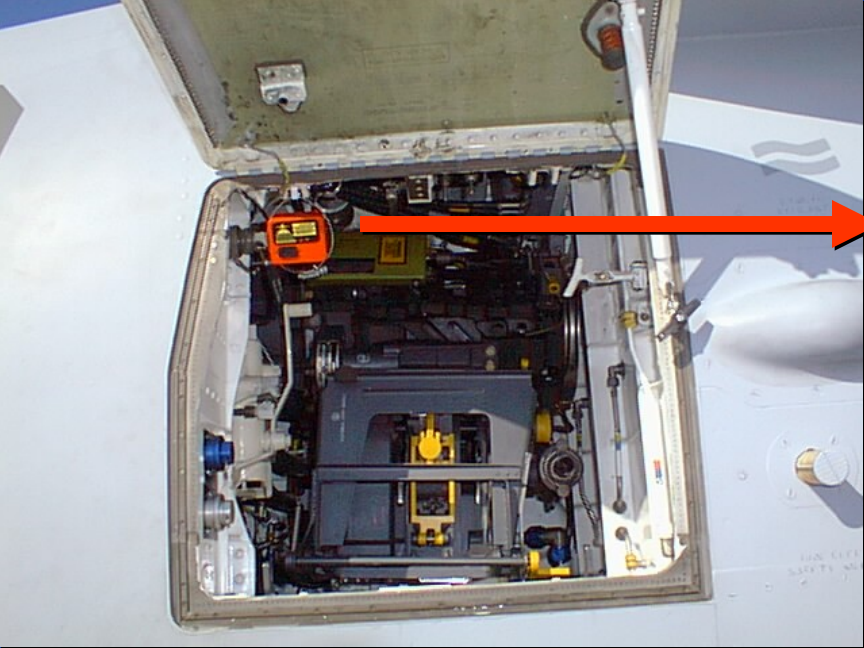
**HISTORICAL CLASS "A"
CAUSAL FACTORS**



Proactive Use of Data



**HISTORICAL CLASS "A"
CAUSAL FACTORS**



Quick Access Recorder



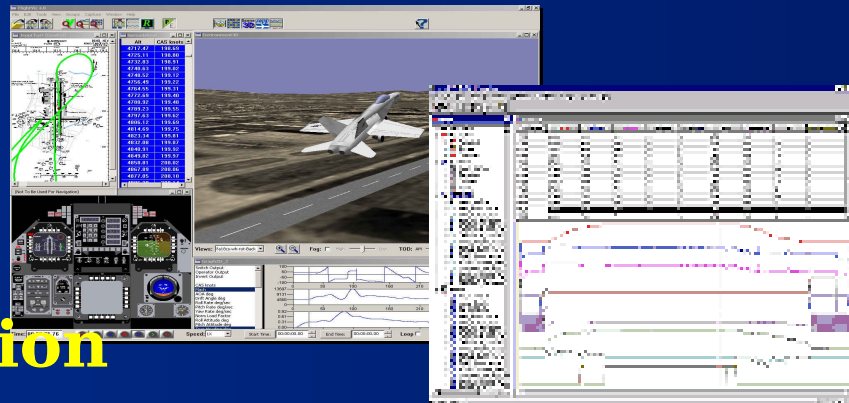
Ruggedized Service Unit



PCMCIA Card



PC Ground Station





Maintenance Application

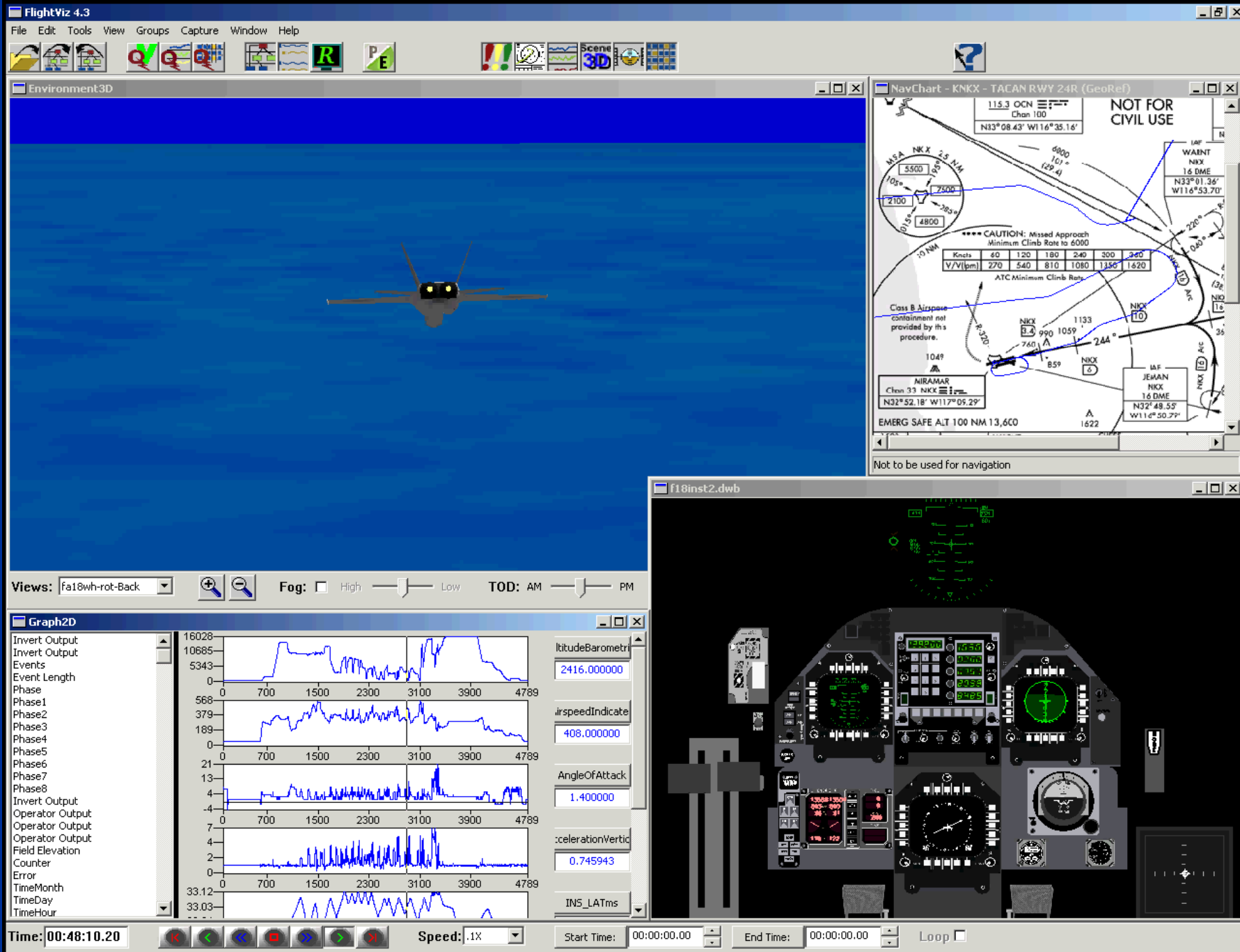
- ✈ Fuel Flow split > 3000 on 4 flights
- ✈ Left avg 400pph > right on all flights
- ✈ Reported by Pilot on 1 flight

*Integrated Maintenance
Diagnostics / Health Usage
Monitoring System (IMD/HUMS)
portion of the technology
provides quantitative information
that we currently rely on the
aircrew to record in flight*



POTENTIAL FLIGHT PERFORMANCE MONITORING AND DEBRIEF

- ✈ ACM - OOCF regime recognition and near miss spatial orientation
- ✈ AG - Altitude and terrain awareness
- ✈ *Military Flight Operations Quality Assurance (MFOQA) Automated scan to detect events in combination with Aircraft Squadron Playback & Analysis System (SPAS) provides quantitative values and trends in Windows-based environment for use during aircrew debrief*





Training Application

- ✈️ **Step beyond TACTS monitoring & replay**
- ✈️ **Increases system awareness**

*Airborne Activity & Requirements
Telemetry (AART) telemeter flight
data to base station to update status
and servicing requirements*



Pilot Comments

- ✈️ I thought I was smoother on the throttles
- ✈️ I know I busted min altitude twice, and this shows it.
- ✈️ I didn't turn on the autopilot.
(replay indicated "Autopilot ON")
- ✈️ I didn't even notice a split in fuel flow between engines in flight



Maintainer Comments

- ✈️ This shows “everything”
- ✈️ Would be great on a “troubled” aircraft
- ✈️ Good for A799 (could not duplicate on deck)
- ✈️ Really doesn’t add any workload



Summary

- ➔ **FOQA Programs are the Norm in Commercial Aviation**
 - Demonstrated significant ROI in economy and safety
- ➔ **MFOQA has demonstrated benefits to Squadron Operations, Training, Maintenance and Safety.**
 - Not a change - only an improvement in the way we do business
- ➔ **MFOQA is a non-punitive, proactive tool that can identify inflight hazards before they result in mishaps**
- ➔ **The system will help us achieve and sustain a marked reduction below the current 6-year plateau in aviation mishap rates.**



DATA

Recorder

INFORMATION

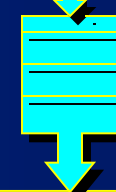
KNOWLEDGE

WISDOM

MFOQA



Squadron



Repository

Web Server



Internet

Web Access





Investigate the Mishap





Prevent the Mishap





***What's
next?***



MFOQA - Next Steps

- ✈️ **CNO, CNAF, Naval Safety Center, NAVAIR and Sister Services have voiced strong support for development and implementation of this proactive technology**
- ✈️ **SECNAV Safety has secured 10.8 million dollars for a large scale MFOQA fleet demonstration**
- ✈️ **Fleet participation in system development, analysis and subsequent integration is essential**



Naval Aviation Class A Flight Mishap Rate FY 50 - 03

776 aircraft
destroyed in
1954

26 aircraft
destroyed in
FY 03
in flight
mishaps

